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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/773,058	01/30/2001	Raghunath Rao	1075-CA (p125US0	6103

7590 08/04/2004

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EXAMINER

NGO, CHUONG D

ART UNIT PAPER NUMBER

2124

DATE MAILED: 08/04/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

SK

Office Action Summary

Application No.

09/773,058

Applicant(s)

RAO ET AL.

Examiner

Chuong D Ngo

Art Unit

2124

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 May 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 1-26 stand rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claims 1-21 clearly recite a calculation process for computing a particular function such as $x^{M/N}$ in accordance with a mathematical algorithm. Claims 22-26 recite an apparatus for implementing the above process, but fail to limit the apparatus to any particular structure other than processing circuit in general. Indeed, any apparatus implementing the underlined process would result in an apparatus as claimed. In order for such a process or a claimed non-specific apparatus implementing the underlined process to be statutory, the claims must include either a step or means that results in a physical transformation outside the computer or a limitation to a practical application. However, it is clear from the claims that the claims merely recite step or non specific means for data computation and manipulation in performing a mathematical function. There is no physical transformation recited in the claims, the input is a number and output is also a number. The claims fail to recite any step or means that includes a limitation to a practical application, or that requires a specific computer to implementing the claimed process. The claims are although amended with new limitations which are, however, no more than fields of use, and thus fail to render the claim statutory. Accordingly, claims 1-26 are clearly directed to a non-statutory subject matter.

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2. Claims 1-3,6-11,14-19 and 22-26 stand rejected under 35 U.S.C. 102(e) as being anticipated by Miyasaka et al (6,304,890).

Miyasaka discloses, for example in figure 7, a calculation of $X^{a/b}$ ($a=1$, $b=3$) including partitioning the range of x into a plurality (3) of intervals n (for $n=0$, $X \leq 225$; for $n=1$, $225 < X \leq 2047$; and for $n=2$, $X > 2047$), determining (S20,S22) which interval n the value of x falls within, dividing (S21, S23,S24) x by a normalization factor $2^{(b*n)}$ ($2^{(0*3)} = 1$, $2^{(1*3)} = 8$, $2^{(2*3)} = 64$) to obtain the normalized value x' in a normalized ranged (1-255), computing (S25) $x'^{(a/b)}$ by a lookup table, and renormalizing by multiplying $x'^{(a/b)}$ by a renormalization factor $2^{(a*n)}$ ($2^{(0*1)} = 1$, $2^{(1*1)} = 2$, $2^{(2*1)} = 4$) as claimed.

3. Claims 4 and 21 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Miyasaka et al (6,304,890) as applied to claims 1,16 and 19 above, and further in view of Dworkin et al. (5,604,691).

It is noted that Miyasaka et al. does not disclose the computing $x^{(a/b)}$ by series expansion. However, Dworkin et al. suggest by figure 1 a computation of a function by series expansion that reduces the amount of memory space (see col. 2, lines 45-51). It would have been obvious to a person of ordinary skill in the art to computing $x^{(a/b)}$ by series expansion as suggested by Dworkin et al. in order to reduce the amount of memory space required to perform the function.

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4. Claims 5,12,13 and 20 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Miyasaka et al (6,304,890) as applied to claims 1,8,16 and 19 above, and further in view of Dworkin et al. (5,600,681).

It is noted that Miyasaka et al. does not disclose the computing $x = (a/b)$ by interpolation. However, Dworkin et al. suggest by figures 1 and 2 a computation of a function by an interpolation method that reduces the amount of memory space (see col. 2, lines 46-52). It would have been obvious to a person of ordinary skill in the art to computing $x = (a/b)$ by interpolation method as suggested by Dworkin et al. in order to reduce the amount of memory space required to perform the function.

5. Applicant's arguments filed on 05/11/04 have been fully considered but they are not persuasive.

Regarding the rejection under 35 U.S.C. 101, it is respectfully submitted that the claims do not include any limitation that result in a physical transformation. The input is a number and output is also a number. Further, the new limitations as now added to the claims, however, are no more than fields of use, and thus fail to render the claim statutory.

Regarding the rejection under 35 U.S.C. 102, it is respectfully submitted that Miyasaka, as clearly explained in the rejection, does teach the partition of the range of x into 3 of intervals: 0: $X \leq 225$, 1: $225 < X \leq 2047$; and 2: $X > 2047$, the determination of which interval the value of X falls within, the division of X by a normalization factor $2^{(b*n)}$ ($2^{(0*3)} = 1$, $2^{(1*3)} = 8$, $2^{(2*3)} = 64$) to obtain the normalized value x' in a normalized ranged (1-255), the

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computation of $x^{(a/b)}$ by a lookup table, and the renormalization by multiplying $x^{(a/b)}$ by a renormalization factor $2^{(a*n)}$ ($2^{(0*1)} = 1$, $2^{(1*1)} = 2$, $2^{(2*1)} = 4$) as claimed.

Regarding the rejections under 35 U.S.C. 103, since Miyasaka clearly teaches the invention of claims 1, 8, 16 and 19, the combinations of Miyasaka and the references to Dworkin et al would render the inventions of claims 4, 5, 12, 13, 20 and 21 obvious as explained in the rejections.

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

7. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

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8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chuong D Ngo whose telephone number is (703) 305-9764.

The examiner can normally be reached on Tuesday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kakali Chaki can be reached on (703) 309-9662. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Chuong D Ngo
Primary Examiner
Art Unit 2124

07/27/2004